3.6 HYDROLOGY AND WATER QUALITY

3.6.1 INTRODUCTION

This section describes the SERP's impacts on hydrology and water quality. Specifically, it discusses the laws and policies relevant to hydrology and water quality, describes the existing hydrologic and water quality conditions in the Phase 1 SERP coverage area, and identifies the significant impacts that may result from the program, as well as mitigation measures to avoid or reduce those impacts.

3.6.2 REGULATORY SETTING

FEDERAL PLANS, POLICIES, REGULATIONS, AND LAWS

Federal Clean Water Act

The U.S. Environmental Protection Agency (EPA) is the lead federal agency responsible for managing water quality. The Clean Water Act (CWA) of 1972 is the primary federal law that governs and authorizes EPA to implement activities to control water quality and is the major federal legislation governing the water quality aspects of the project. The objective of the act is "to restore and maintain the chemical, physical, and biological integrity of the nation's waters." The CWA establishes the basic structure for regulating discharge of pollutants into the waters of the United States and gives EPA the authority to implement pollution control programs. EPA has delegated to the State of California the authority to implement and oversee most of the programs authorized or adopted for CWA compliance through the state's Porter-Cologne Water Quality Control Act of 1969 (Porter-Cologne Act), which is described below. The various elements of the CWA that address water quality and are applicable to the proposed program are discussed below.

Section 401 Water Quality Certification

Section 401 of the CWA requires an applicant for any federal license or permit (e.g., a section 404 permit, described below) that may result in a discharge into waters of the United States to obtain a certification that the discharge would comply with provisions of the CWA. Because the authority to implement this program has been delegated by EPA to the individual states, the certification is described more fully below. The State Water Resources Control Board (SWRCB) and Regional Water Quality Control Boards (RWQCBs) administer this program. RWQCBs administer the program in most cases, but the SWRCB issues 401 certifications for projects that would take place in two or more regions. Any condition of a 401 certification (or water quality certification), as well as the federal antidegradation analysis, would be incorporated into the USACE section 404 permit. Compliance with CWA section 401 for the SERP would be achieved through development of a programmatic 401 water quality certification from the Central Valley RWQCB. Issuance of a 401 water quality certification or

waiver from the Central Valley RWQCB is a requirement for issuance of the SERP Regional General Permit (RGP) from USACE.

Section 402 National Pollutant Discharge Elimination System

Section 402 of the CWA established a permit system known as the National Pollutant Discharge Elimination System (NPDES) to regulate point sources of discharges in navigable waters of the United States. In California, EPA has granted the SWRCB and RWQCBs the authority to issue NPDES permits to point-source dischargers. Under Section 401 of the CWA (discussed above) and the Porter-Cologne Water Quality Control Act (discussed further below), the state also issues either waste discharge requirements (WDRs) or conditioned water quality certification for other discharges.

Section 404 Discharge of Dredged or Fill Materials

In accordance with CWA section 404, USACE regulates and issues permits for activities that involve the discharge of dredged or fill materials into waters of the United States, which include navigable waters of the United States, interstate waters, all other waters where the use or degradation or destruction of the waters could affect interstate or foreign commerce, tributaries to any of these waters, and wetlands that meet any of these criteria or that are adjacent to any of these waters or their tributaries. While important to water quality, the section 404 program primarily addresses overall aquatic habitat functions and is therefore addressed in more detail in Section 3.3, “Biological Resources.” Compliance with CWA section 404 for the SERP would be achieved through issuance of an RGP from USACE.

Water Quality Criteria and Standards

In accordance with federal law, EPA has published water quality regulations under Volume 40 of the Code of Federal Regulations (40 CFR). Section 303 of the CWA requires states to adopt water quality standards for all surface waters of the United States. As defined by the CWA, water quality standards consist of two elements: (1) designated uses of the water body in question, and (2) criteria that protect the designated uses. Section 304(a) requires EPA to publish advisory water quality criteria that accurately reflect the latest scientific knowledge on the kind and extent of all effects on health and welfare that may be expected from the presence of pollutants in water. Where multiple uses exist, water quality standards must protect the most sensitive use. In California, EPA has granted SWRCB and the RWQCBs the authority to identify beneficial uses and adopt applicable water quality objectives.

Section 303(d) Impaired Waters List

Under section 303(d) of the CWA, states, territories, and tribes are required to develop an impaired water list of all water bodies where pollution controls are not sufficient to attain or maintain applicable water quality standards. The law requires that states establish a prioritized

schedule for waters on the lists and develop a total maximum daily load (TMDL) for the identified waters based on the severity of the pollution and the sensitivity of the uses to be made of the waters. The TMDL is the amount of the identified pollutant(s) (i.e., the loading) that the water body can receive and still be in compliance with water quality standards. The TMDL can also act as a plan to reduce loading of a specific pollutant from various sources to achieve compliance with water quality goals and objectives. After implementation of the TMDL, it is anticipated that the problems that led to placement of a given pollutant on the Section 303(d) list would be remediated. Six waterway segments within the Phase 1 SERP coverage area are listed on the 303(d) Impaired Waterways List. These waterways are described in Section 3.6.3, “Environmental Setting,” below.

National Toxics Rule and California Toxics Rule

In 1992, pursuant to the CWA, EPA issued the National Toxics Rule (NTR) to establish numeric criteria for priority toxic pollutants for California. The State must use these criteria together with the State's existing water quality regulations when controlling pollution in inland waters and enclosed bays and estuaries. The NTR established water quality criteria for 42 pollutants not covered, at that time, under California’s statewide water quality regulations. In May 2000, EPA issued the California Toxics Rule (CTR) that issued numeric criteria for priority pollutants not included in the NTR. The CTR documentation (65 *Federal Register* 31682, May 18, 2000) “carried forward” the previously issued criteria of the NTR, thereby providing a single document listing California’s fully adopted and applicable water quality criteria for priority pollutants.

National Flood Insurance Program and Flood Insurance Rate Maps

The Federal Emergency Management Agency (FEMA) administers the National Flood Insurance Program to provide subsidized flood insurance to communities that comply with FEMA regulations that limit development in floodplains. FEMA also issues Flood Insurance Rate Maps (FIRMs) that identify which land areas are subject to flooding. These maps provide flood information and identify flood hazard zones in the community. The design standard for flood protection covered by the FIRMs is established by FEMA, with the minimum level of flood protection for new development determined to be the 1-in-100 annual exceedance probability (AEP) (i.e., the 100-year flood event). As developments are proposed and constructed, FEMA is also responsible for issuing revisions to FIRMs, such as Conditional Letters of Map Revision and Letters of Map Revision, through the local agencies that work with the National Flood Insurance Program. FEMA 100- and 500-year Flood Zone areas in the Phase 1 SERP coverage area are shown in Exhibit 3.6-1.

Executive Order 11988

Executive Order 11988 (Floodplain Management, 44 CFR Part 9) addresses floodplain issues related to public safety, conservation, and economics. Executive Order 11988 generally requires federal agencies constructing, permitting, or funding a project to:

- avoid incompatible floodplain development,
- be consistent with the standards and criteria of the National Flood Insurance Program, and
- restore and preserve natural and beneficial floodplain values.

The SERP would reduce the risk of flood loss and minimize the impact of floods on human health, safety, and welfare by strengthening existing flood damage reduction infrastructure.

Section 10 of the Rivers and Harbors Act

Section 10 of the Rivers and Harbors Act (33 U.S. Code 401 et seq.) requires authorization from USACE for the construction of any structure over, in, or under navigable waters of the United States. In addition, authorization is required for excavation/dredging or deposition of material or any obstruction or alteration in navigable waters. Navigable waters are those subject to the ebb and flow of the tide and those that are presently used, have been used in the past, or may be susceptible to use to transport interstate or foreign commerce (55 CFR 329.4). Compliance with section 10 of the Rivers and Harbors Act would be achieved through issuance of a regional general permit (RGP) from USACE.

STATE PLANS, POLICIES, REGULATIONS, AND LAWS

Porter-Cologne Water Quality Control Act

The Porter-Cologne Act of 1969 is California's statutory authority for the protection of water quality. Under the act, the state must adopt water quality policies, plans, and objectives that protect the state's waters for the use and enjoyment of the people. In 1972, the Porter-Cologne Act was amended to delegate California with the authority and ability to operate as the state water pollution control agency for all purposes under the Clean Water Act, including the NPDES permit program. This law also requires regional water quality plans to be adopted and implemented by issuing waste discharge requirements (WDRs) to each discharger of waste that could affect the waters outside of Federal Jurisdiction or "waters of the state".

Regional authority for planning, permitting, and enforcement is delegated to the nine RWQCBs. The RWQCBs are required to formulate and adopt water quality control plans (known as basin plans) for all areas in the region and establish water quality objectives in the plans. The Phase 1 SERP coverage area is within the jurisdiction of the Central Valley RWQCB.

Source: DWR 2009, FEMA 2009, Adapted by AECOM 2013

Exhibit 3.6-1

100-Year and 500-Year Floodplains

NPDES Permit System

SWRCB and Central Valley RWQCB have adopted specific NPDES permits for a variety of activities that have potential to discharge wastes to surface water bodies. The SWRCB General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Order 2009-0009-Division of Water Quality [DWQ]) is applicable to all land-disturbing construction activities that would affect 1 acre or more. Some NPDES permits may also serve as WDRs, as discussed further below. The Tier 1 SERP projects would disturb 0.1 acre or less of nonadjacent area and the Tier 2 projects would disturb 0.5 acre or less of nonadjacent area. Thus, SERP projects would not be subject to this permit, although they would be subject to county sediment and erosion control measures at the local level.

The Central Valley RWQCB general NPDES permit for construction dewatering activity (Order No. R5-2008-0081) authorizes direct discharges to surface waters up to 250,000 gallons per day for no more than a 4-month time period each year. No site dewatering activities would occur, however, including temporary diversion of flows around the work area, unless deemed necessary by the California Department of Fish and Wildlife and U.S. Fish and Wildlife Service, to avoid impacts to giant garter snake.

Water Quality Control Plan for the Sacramento River and San Joaquin River Basins and Waste Discharge Requirements

The Central Valley RWQCB is responsible for preparing and implementing the *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins* (Basin Plan), adopted in 1998 and revised in October 2007 (Central Valley RWQCB 2007). The Basin Plan identifies the beneficial uses of water bodies and provides water quality objectives for waters of the Sacramento River and San Joaquin River hydrologic regions. Federal and state laws mandate the protection “beneficial uses” of water bodies. State law defines beneficial uses as “domestic; municipal; agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves” (Water Code section 13050[f]). Beneficial uses of the water bodies in the Phase 1 SERP coverage area are shown in Table 3.6-2.

Cherokee Canal, Colusa Bypass, Sacramento Bypass, Tisdale Bypass, Wadsworth Canal, and Willow Slough Bypass (see Exhibit 3.6-1 for the Phase 1 SERP coverage area) do not currently have any specifically designated beneficial uses attributed to them in the Basin Plan. Consequently, the Central Valley RWQCB applies the Basin Plan’s “tributary rule” and assigns to these creeks the beneficial uses designated for the nearest downstream location.

The Central Valley RWQCB also regulates waste discharges in undesignated streams to ensure that downstream water quality conditions and beneficial uses are not degraded. Thus, these creeks are subject to regulation for the existing beneficial uses in their receiving water bodies.

On May 4, 2004, the SWRCB adopted State Water Board Order No. 2004-0004-DWQ, Statewide General Waste Discharge Requirements for Dredged or Fill Discharges to Waters Deemed by the 28 USACE to be Outside of Federal Jurisdiction (General WDRs). The General WDRs are intended to cover small-scale projects (small acreage or linear feet and those involving a small volume of discharged dredged material with few or no permanent impacts for which USACE "disclaims" Federal jurisdiction.

General WDRs for Dredged or Fill Discharges, State Water Board Order No. 2003-0017-DWQ, are for projects that have received State water quality certification. These General WDRs are restricted to dredged or fill discharges of not more than 0.2 acre and 400 linear feet for fill and excavation discharges, and not more than 50 cy for dredged discharges. For larger projects, the RWQCBs issues Individual WDRs. Certification and issuance of WDRs are overlapping regulatory processes that are both administered by the SWRCB and RWQCBs.

SWRCB Resolution No. 68-16

SWRCB Resolution No. 68-16 contains the state antidegradation policy, which is titled "Statement of Policy with Respect to Maintaining High Quality Waters in California." SWRCB has interpreted Resolution No. 68-16, a predecessor to the federal policy, to incorporate the federal antidegradation policy where the federal policy applies (Order No. WQ 86-17). The state antidegradation policy applies more comprehensively to water quality changes than the federal policy. In particular, the state policy applies to all waters of the state, including both groundwater and surface water, whose quality meets or exceeds water quality objectives. The policy states that the disposal of wastes into state waters shall be regulated to achieve the highest water quality consistent with maximum benefit to the people of the state and to promote the peace, health, safety, and welfare of the people of the state. Compliance with SWRCB Resolution No. 68-16 would be achieved through a programmatic water quality certification from the Central Valley RWQCB and a section 404 RGP from USACE.

California Water Code

Among the many sections of the California Water Code that are related to the State's responsibilities, sections 8350, 8361, 12648, and 12878 authorize DWR to maintain federal project levees of the Sacramento River Flood Control Project.

Title 23

CCR Title 23 contains regulations and guidelines to regulate the modification and construction of levees and floodways to ensure public safety. The regulations state that review and an encroachment permit from the Central Valley Flood Protection Board (CVFPB) are required for any project or plan of work that is within federal flood control project levees and within a board easement, may have an effect on the flood control functions of project levees, is within a board

designated floodway, or is within regulated Central Valley streams listed in Table 8.1 in Title 23 of the CCR.

Following a review of the regulations, and SERP geotechnical designs and hydrologic analysis, the CVFPB passed Resolution 2012-20 on April 27, 2012, deeming all SERP program activities to be operations and maintenance activities not requiring CVFPB encroachment permits. The Resolution also directed CVFPB staff to assist DWR as necessary to finalize the SERP Manual, including geotechnical and hydraulic analysis review procedures, long-term vegetation maintenance procedures, and SERP member agency and public notification procedures; to review annual SERP repair proposals for conformance with the SERP Manual; and to provide an annual report on the SERP to the CVFPB including a detailed listing of annually authorized SERP sites.

REGIONAL AND LOCAL PLANS, POLICIES, REGULATIONS, AND ORDINANCES

Integrated Regional Water Management Plans

As a result of the passage in 2002 of Proposition 50, the Water Security, Clean Drinking Water, Coastal and Beach Protection Act, Integrated Regional Water Management Plans (IRWMPs) are required for regional management of water resources in at least four main areas: water supply, groundwater management, ecosystem restoration, and water quality. Projects and programs included in IRWMPs are designed to integrate multiple strategies and projects to provide multiple benefits both locally and regionally.

Several IRWMPs within the Phase 1 SERP coverage area spatially overlap and thus provide a forum for coordination. The Sacramento Valley IRWMP shares planning areas with the Upper Feather River IRWMP, the Four County IRWMP, and the American River Basin IRWMP.

County General Plans

The Phase 1 SERP coverage area includes six California counties (i.e., Sacramento, Yolo, Solano, Sutter, Colusa, and Butte), as shown in Exhibit 2-1 of Chapter 2, “Project Description.” Each of these counties has general plans with unique goals and policies that address construction practices with respect to erosion control, flood control, and water quality best management practices (BMPs). The breadth of these goals and policies precludes comprehensive coverage here.

3.6.3 ENVIRONMENTAL SETTING

CLIMATE AND PRECIPITATION

The Phase 1 SERP coverage area is located in the Sacramento River hydrologic region, which covers 27,210 square miles and includes the entire area drained by the Sacramento River

(Exhibit 3.6-1). For planning purposes, this includes all watersheds tributary to the Sacramento River that are north of the Cosumnes River watershed (Central Valley RWQCB 2007:1-1). The Phase 1 levees from Butte Creek in the north to the Cache Creek north levee in the south are within the Colusa Basin Hydrologic Unit. The Cache Creek south levee, Willow Slough, and Putah Creek are within the Valley Putah-Cache Basin Hydrologic Unit, and the Sacramento River segment to the east is within the Sacramento Delta Hydrologic Unit. The Sacramento Valley floor has a typical Mediterranean climate, with mild winters during which the majority of precipitation occurs, and hot dry summers. Overall annual precipitation in the region generally increases from south to north and west to east. The heavy snow and rain that falls in this region contributes to the overall water supply for the entire state. Average annual rainfall in the Phase 1 SERP coverage area ranges from 15 to 22.5 inches (FRAP 2007).

Topography and Land Cover

The Phase 1 SERP coverage area is within the Sacramento Basin, with generally flat topography. The Sacramento Basin is bounded by the Sierra Nevada to the east and the Coast Ranges and San Francisco Bay to the west. Most of the valley floor is close to sea level, with most of the valley boundary along the eastern edge approximately 500 feet above sea level and most of the western boundary ranging from 50 feet to 350 feet above sea level (Faunt 2009).

The Sacramento River supports about 2,145,000 acres of irrigated agriculture (22% of the state total). About 1,847,000 acres are irrigated on the valley floor. Crop statistics show that irrigated agricultural acreage in the region peaked during the 1980s and has since declined. The main reason for this decline is the conversion of irrigated agricultural lands to urban development and managed wetlands. Urban use occurs in smaller areas of the valley and is dispersed along the major transportation routes. A few of the larger cities in the region take the major share of their water supplies from major rivers, but throughout most of the Sacramento River region, groundwater is the principal source of water for urban and rural dwellers. In the rural mountain areas of the region, domestic supplies come almost entirely from groundwater (DWR 2009a:8).

Surface Water

The Phase 1 SERP coverage area encompasses the Lower Sacramento River reach and tributaries (Exhibit 3.6-1). The Lower Sacramento River is generally defined as the portion of the river from Princeton (in Colusa County) to the Sacramento–San Joaquin Delta (Delta), at Chipps Island. Flows in the Lower Sacramento River are largely controlled by Shasta and Keswick Dams on the Upper Sacramento River. Shasta Dam provides flood protection for the Sacramento area and is part of the Central Valley Project operated by the U.S. Bureau of Reclamation. The portion of the Lower Sacramento River that forms the west border of the

region is predominantly channelized, has levees, and is bordered by agricultural lands and the county and city of Sacramento (DWR 2009a:6).

All waterways in the Phase 1 SERP coverage area are tributary to the Sacramento River:

- Putah Creek begins on Boggs Mountain south of Clear Lake, drains into Lake Berryessa, passes through Winters and Davis, and flows across the Sacramento Valley to end at the Yolo Bypass.
- Cache Creek begins in Lake County about 9 miles north of Clear Lake; many tributaries enter the lake, but the North Fork bypasses to the east through Indian Valley Reservoir. The creek traverses Capay Valley and the Sacramento Valley floor, passing near Woodland to end at the Yolo Bypass.
- The Feather River begins on the Sierra crest from Donner Summit to its northern end and in the Cascades west of Honey Lake. The system passes through several major reservoirs including Lake Almanor, Lake Oroville, and New Bullards Bar Reservoir. The river reaches the valley floor and flows along the east side of the valley, joining the Sacramento River at Verona.
- Butte Creek begins in northern Butte County, passes near Paradise and southeast of Chico, and ends at the Butte Sink west of the Sutter Buttes.

Table 3.6-1 lists the CWA section 303(d) impaired water body segments in the Phase 1 SERP coverage area.

Table 3.6-2 shows the designated beneficial uses for the water bodies in the Phase 1 SERP coverage area as defined by the Basin Plan.

GROUNDWATER

The Phase 1 SERP coverage area is located within the Sacramento Valley subregion of the Central Valley aquifer. Groundwater quality in the Sacramento River subregion is generally good, although there are localized problems (DWR 2003).

The major source of groundwater recharge in the Sacramento Valley subregion is natural recharge (i.e., precipitation). Large-scale groundwater development for both agricultural and urban uses has modified the groundwater levels and flow patterns relative to predevelopment conditions in the Sacramento Valley. Groundwater flow has become more rapid and complex, with groundwater pumpage and application of excess irrigation water resulting in steeper hydraulic gradients and shortened flow paths between sources and sinks (Faunt 2009:79)

Table 3.6-1
CWA Section 303(d)-Listed Water Body Segments in Phase 1 SERP Coverage Area

Water Body	Pollutant/Stressor	Potential Sources
Sacramento River (Red Bluff to the Delta)	Mercury	Resource Extraction (mercury listing only applies to the area from Hamilton City downstream to Knights Landing)
	Unknown Toxicity	Source Unknown
Colusa Basin Drain	Azinphos-methyl; Carbofuran; Diazinon; Group A Pesticides; Malathion; Methyl Parathion; Unknown Toxicity	Agriculture
	Molinate/Ordram	Agriculture—irrigation tailwater
Feather River, Lower (Lake Oroville Dam to Confluence with Sacramento River)	Chlorpyrifos; Unknown Toxicity	Source Unknown
	Group A Pesticides	Agriculture
	Mercury	Resource Extraction
Wadsworth Canal	Diazinon	Agriculture
Cache Creek, Lower (Clear Lake Dam to Cache Creek Settling Basin near Yolo Bypass)	Unknown Toxicity	Source Unknown
Putah Creek (Solano Lake to Putah Creek Sinks)	Mercury	Resource Extraction

Source: SWRCB 2007

Table 3.6-2
Designated Beneficial Uses of Water Bodies in the Phase 1 SERP Coverage Area

Beneficial Use	Butte Creek—Below Chico	Colusa Basin Drain	Sutter Bypass	Feather River	Cache Creek (a)	Putah Creek	Sacramento River	Yolo Bypass
Municipal and Domestic Supply		√		√	√	√	√	
Agriculture—Irrigation	√	√	√		√	√	√	√
Agriculture—Stock Watering	√	√			√	√	√	√
Industry—Process					√	√		
Industry—Service Supply					√		√	
Industry—Power				√		√	√	
Recreation—Contact	√	√	√	√	√	√	√	√
Recreation—Canoeing and Rafting	√	√		√	√	√	√	
Recreation—Other Noncontact		√		√	√	√	√	√
Freshwater Habitat—Warm	√	√	√		√	√	√	√
Freshwater Habitat—Cold	√	√		√	√	√	√	√
Migration—Warm		√			√			√
Migration—Cold		√	√		√			√
Spawning—Warm	√	√			√	√	√	√
Spawning—Cold		√	√	√	√		√	
Wildlife Habitat	√	√	√	√	√	√	√	√
Navigation				√			√	

Source: Central Valley RWQCB 2007
(a) The following beneficial uses also exist for Clear Lake tributaries. Mud Slough (north): Commercial and Sports Fishing (COMM) and Shellfish Harvesting (SHELL); Salt Slough: COMM, Preservation of Biological Habitats of Special Significance (BIOL), SHELL; Wetland Water Supply Channels: BIOL; Clear Lake: COMM. The following Beneficial uses exist for Cache Creek from Clear Lake to Yolo Bypass and in the following tributaries only: North Fork Cache Creek and Bear Creek.

DRAINAGE

Water use in the Sacramento River region is mostly for agricultural production with more than 2 million irrigated acres in 2000. Much of the economy of the region relies on agricultural water supplies, which are diverted and distributed through extensive systems of canals and drains. Basinwide water use efficiency is generally high, because many return flows from fields are captured by drainage systems and then resupplied to other fields downstream. The larger urban areas in the region have developed near major rivers, so surface water diversions are a key component of municipal water supplies (DWR 2009a:12).

LEVEES AND FLOODING

Floods within the Phase 1 SERP coverage area originate principally from heavy rainfall, rarely from snowmelt. Most flood events occur in December and January as a result of multiple storms and saturated soil conditions, but floods can occur in October and November or during late winter or early spring. Flood hazards in the region include (DWR 2009b:15–16):

- 100-year flood zones (Exhibit 3.6-1);
- 500-year flood zones (Exhibit 3.6-1);
- highways and roads vulnerable to the 100-year flood;
- insufficient capacity of some existing culverts and channels to carry flow resulting from the 100-year flood;
- some existing levees of unsound, porous, or unknown composition;
- some existing levees that are unable to retain the 100-year flood; and
- insufficient flood flow capacity due to structural constraints (e.g., levees constructed too close to the channel).

3.6.4 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

Based on Appendix G of the CEQA Guidelines, the SERP would result in a significant impact on drainage, hydrology, or water quality if it would:

- violate any water quality standards or waste discharge requirements, including NPDES waste discharge or stormwater runoff requirements, state or federal antidegradation policies, enforceable water quality standards contained in the Central Valley RWQCB Basin

Plan or statewide water quality control plans, or federal rulemakings to establish water quality standards in California;

- otherwise substantially degrade water quality through contribution of additional sources of polluted runoff;
- create or contribute runoff water that would exceed the capacity (peak flow) of existing or planned stormwater drainage systems;
- substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on-site or off-site, or result in increased flooding on- or off-site;
- substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a substantial lowering of the level of the local groundwater table;
- place within a flood hazard area structures that would impede or redirect flood flows;
- expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam; or
- result in inundation by seiche, tsunami, or mudflow.

For purposes of these thresholds, “flood hazard area” means an area that does not meet the minimum level of flood protection required by state or federal law, whichever is more stringent. Reduction of the risk of flooding caused by a 100-year flood was the standard applicable until the Central Valley Flood Protection Act of 2008, (Senate Bill [SB] 5), defined more stringent objectives for reducing the risk of flooding in the Central Valley, namely, either reduction of flood risk from a 200-year flood or “adequate progress” toward meeting the 200-year standard for flood risk reduction by 2025. The Central Valley Flood Protection Plan was developed to comply with objectives outlined in SB 5, and was adopted on June 29, 2012 by the CVFPB.

Impacts Not Discussed Further in This EIR

Because the SERP involves erosion repair and maintenance at currently undefined sites along existing levees, the analysis assumes that no new permanent housing, which would be subject to flood hazards, would be constructed because of the erosion repairs. Furthermore, the intent of the SERP is to repair small erosion sites within the same year, before they can expand into larger erosion areas that might threaten levee stability and thus the safety of nearby housing. Therefore, the SERP would have a beneficial impact on housing within a 100-year flood hazard area by reducing the risk of flooding at repaired erosion sites.

Impacts related to depletion of groundwater supplies or interference with groundwater recharge that could affect the level of the local groundwater table are not evaluated further in this DEIR. SERP activities would not require the use of groundwater, nor result in additional impervious surfaces that could interfere with groundwater recharge. No SERP activities would require excavation to groundwater. Levee cutoff (slurry) walls, which could affect flow exchange between a river and groundwater, are also not included as a SERP activity.

Although much of the low-lying valley area where the Phase 1 SERP coverage area is located is exposed to potential flooding from catastrophic failure of the major dams located upstream—Black Butte, Oroville, New Bullards Bar, and Folsom Dams—SERP activities would not increase the potential for dam failure.

Earthquakes can create hazards in relation to open bodies of water in two ways: by creating seismic sea waves (tsunamis) and by creating seiches. No project components would be subject to tsunamis because the Phase 1 SERP coverage area is not in the tsunami inundation zone (DOC 2007); the area is too distant from the ocean. Seiches are earthquake-induced oscillations of water, which can occur for a few minutes or several hours, in an enclosed or restricted water body such as a basin, river, or lake. Because the Delta consists of a network of interconnected bays and sloughs, any waves generated in a portion of this water body by an earthquake would likely be damped and would not develop a substantial “back and forth” motion of sufficient magnitude to overtop the levees. Seiches are unlikely to develop in the river systems north of the Delta because of the long distance from active seismic sources. For these reasons, these impacts are not evaluated further in the DEIR.

The topography within and surrounding the coverage area is relatively level and not subject to mudflow, and erosion repairs would be intended to repair and/or prevent mudflow and other types of erosion at the individual sites. These impacts are not evaluated further in this DEIR. Erosion control measures discussed in Impact 3.6-1 below would prevent localized mudflow to receiving waters due to construction on levees.

Analysis Methodology

This impact analysis assumes that hydrology and/or water quality could be affected by proposed program actions. Impacts caused by program actions potentially affecting hydrology and water quality are:

- accidental spills of petroleum products or drilling lubricants;
- removal or disturbance of vegetation;
- removal, disturbance, or exposure of soils;
- temporary runoff of petroleum products, concrete, or other construction-related materials;
- disturbance, removal, or burial of stream channel substrate;
- alteration or arrest of fluvial sediment processes;

- alteration of channel dimensions;
- temporary mobilization of fine sediment in surface water; and
- discharge of effluent containing contaminants related to program activities.

Effects associated with hydrology and water quality that could result from construction and operational activities related to SERP activities were evaluated based on the criteria described in Chapter 2, “Project Description,” including expected construction practice, materials used, and locations and duration of the construction activities. Project effects were compared to environmental baseline conditions (i.e., existing conditions) to determine the duration and magnitude of impacts, consistent with the CEQA Guidelines. The impact analysis assumes that DWR would conform to the latest requirements and standards pertaining to construction, maintenance, and runoff, and conform to the performance standards listed in the SERP Manual, provided in Appendix B of this DEIR.

IMPACT ANALYSIS

IMPACT 3.6-1 ***Temporary Water Quality Effects from Stormwater Runoff, Erosion, and Spills Associated with Construction.*** *The programmatic approval of erosion repairs under the SERP would enable DWR to implement repair activities within the same year that the damage is identified, reducing the amount of levee-side erosion and sedimentation that take place between identification of the damage and completion of the repair. Ground-disturbing activities associated with project construction could cause soil erosion and sedimentation of local drainages and waterways. Construction activities could also discharge waste petroleum products or other construction-related substances that could enter these waterways in runoff. These discharges could adversely affect river water quality. Because mandatory conservation measures to prevent release of soil or other materials into these waters are incorporated into Section I of the SERP Manual and would be applied to all SERP projects, this impact would be* ***less than significant****.*

The Phase 1 SERP is proposed by DWR as a means to accomplish small (0.1- to 0.5-acre) erosion repairs along levees maintained by DWR within the SRFCP area. The programmatic approval of erosion repairs under the SERP would enable DWR to implement repair activities within the same year that the damage is identified, reducing the amount of levee-side erosion and sedimentation that take place between identification of the damage and completion of the repair. A benefit of the SERP is that it reduces the hydrology and water quality effects of ongoing erosion damage on levees within the Phase 1 SERP coverage area.

Project construction activities would include use of construction equipment (bulldozers, trucks, barges, and excavators) for vegetation clearing, soil and riprap material placement, incorporation of plantings, and demobilization/cleanup. These activities have the potential to temporarily impair water quality because the discharge into receiving waters of construction-related wastes could include disturbed and eroded soil and petroleum products. Soil and

associated contaminants that enter receiving waters through stormwater runoff and erosion can increase turbidity, stimulate algae growth, increase sedimentation of aquatic habitat, and introduce compounds that are toxic to aquatic organisms. Accidental spills of construction-related substances such as oils, fuels, and levee repair materials can contaminate both surface water and groundwater. The extent of potential water quality effects would depend on the tendency for the soil types encountered to erode, the SERP design template used, the extent of the disturbed area, the duration of construction activities, the timing of particular construction activities as related to the rainy season, and the sensitivity of receiving water bodies to contaminants of concern.

Section I of the SERP Manual (Appendix B of this DEIR) contains conservation measures that are incorporated into the program to prevent and minimize stormwater runoff, erosion, and spills associated with SERP activities such as discharges to receiving waters or off-site. The following is a summary of the requirements included in these measures:

Timing Restrictions. Construction activities in-water and outside of the stream channel in each of the four regions in the Phase 1 SERP coverage area will take place outside of the rainy season (i.e., between April 15 and October 15), unless written approval is obtained from the regulatory agencies (see Exhibit I-1 and Page I-3). Construction activities will be timed to avoid precipitation and increases in stream flow. If there is a chance of rain within 48 hours, the project site will be prepared with adequate erosion control measures to protect against wind and water erosion. Within 24 hours of any predicted storm event, construction activities within the stream zone will cease until all reasonable erosion control measures, inside and outside of the stream zone, have been implemented (Appendix B, SERP Manual, Section I, “Conservation Measures”).

Minimization of Vegetation and Habitat Disturbance. Disturbance to soil and vegetation will be limited to the actual site of the project, necessary access routes, and staging areas. The number of access routes, the size of staging areas, and the total area of the project activity will be limited to the minimum necessary for the erosion repair. All roads, staging areas, and other facilities will be placed to avoid and limit disturbance to streambank or stream channel habitat as much as possible. The amount of rock riprap and other materials used for bank protection will be limited to the minimum needed for erosion protection. All herbicides (and pesticides) used to control nonnative vegetation will be used in accordance with label directions. Methods and materials used for herbicide application will be in accordance with DWR’s most current guidelines on herbicide use and with laws and regulations administered by the Department of Pesticide Regulation (Appendix B, SERP Manual, Section I, “Conservation Measures”). It is anticipated that SERP projects will generally achieve “self-mitigation” for unavoidable impacts to biological resources through application of the bioengineering erosion control methodologies (Appendix B, SERP Manual, Section G, “Mitigation”).

Construction Equipment Staging. Construction materials such as portable equipment, vehicles, and supplies, including chemicals, will be stored at designated construction staging areas and on barges, exclusive of any riparian or wetland areas. Barges will be used to stage equipment and construct the project when practical to minimize noise and traffic disturbances and effects on existing landside vegetation. When barge use is not practical, construction equipment and plant materials will be staged in designated landside areas adjacent to the project sites (Appendix B, SERP Manual, Section I, “Conservation Measures”).

Material Stockpiling. Stockpiling of soil and grading spoils will occur in designated areas on the landside of the levee reaches or on offshore barges. Sediment barriers (e.g., silt fences, fiber rolls, straw bales) will be installed to intercept runoff and sediment during storm events, and stockpiles will be covered to provide further protection against wind and water erosion if necessary (Appendix B, SERP Manual, Section I, “Conservation Measures”).

Erosion Control During Construction. Erosion control measures (i.e., BMPs) that minimize soil or sediment from entering waterways and wetlands will be installed, monitored for effectiveness, and maintained throughout construction operations. DWR will ensure sand, sediment, or sediment-water slurry does not enter the stream channel. Adequate erosion control supplies (e.g., gravel, straw bales, shovels) will be kept at all construction sites during all construction and maintenance activities to ensure their availability to keep sand and sediments out of any water bodies. Precautions to minimize turbidity/siltation will be taken into account during project planning and will be implemented at the time of construction. All disturbed soils will undergo appropriate erosion control treatment (e.g., sterile straw mulching, seeding, planting) prior to the end of the construction season, or prior to October 15, whichever comes first (Section I, Conservation Measures).

Hazardous Materials. DWR will exercise every reasonable precaution to protect streams and other waters from pollution with fuels, oils, bitumens, calcium chloride, and other harmful materials. Gas, oil, or other petroleum products, or any other substances that could be hazardous to aquatic life and resulting from project-related activities, will be prevented from contaminating the soil and/or entering waters of the state and/or waters of the United States. No solid petroleum products, such as asphalt, concrete, or similar rubble, will be used. Construction vehicles and equipment will be checked daily for leaks and will be properly maintained to prevent contamination of soil or water from external grease and oil or from leaking hydraulic fluid, fuel, oil, and grease. A written Spill Prevention and Control Plan (SPCP) will be prepared, and the SPCP and all material necessary for its implementation will be accessible on-site prior to initiation of project construction, and throughout the construction period. The SPCP will include a plan for the emergency cleanup of any spills of fuel or other material. Employees will be provided the necessary information from the SPCP to prevent or reduce the discharge of pollutants from construction activities to waters and to use the appropriate measures should a spill occur. Any such spills, and the cleanup efforts, will be

reported in an incident report and submitted to the SERP agencies (Appendix B, SERP Manual, Section I, “Conservation Measures”).

Other Mandatory Conservation Measures. All materials placed in streams, rivers, or other waters will be nontoxic. No fill material other than silt-free gravel or riprap will be allowed to enter the live stream. Water containing mud or silt from construction activities will be treated by filtration, or retention in a settling pond, adequate to prevent muddy water from entering live streams (Appendix B, SERP Manual, Section I, “Conservation Measures”).

These measures require preparation and implementation of appropriate BMPs such as runoff source control, detention basins, revegetation, and erosion control, to maintain surface water quality conditions in adjacent receiving waters. Several technical studies have been conducted regarding the impacts of water quality control features on groundwater and surface water (e.g., *California Stormwater Best Management Practice Handbook* prepared by the Stormwater Quality Task Force [California Stormwater Quality Association 2003], *Preliminary Data Summary of Urban Storm Water Best Management Practices* [EPA 1999] and *Truckee River Basin Stormwater Management Program, Program Years 2007–2012* [Placer County 2007]). These studies have identified that water quality control features such as revegetation, erosion control measures, and detention and infiltration basins have been successful in controlling water quality and avoiding water quality impacts. Further, technical studies associated with the Truckee River Basin Stormwater Management Program demonstrated that the use of a variety of BMPs such as source control, detention basins, revegetation, and erosion control have maintained surface water quality conditions in adjacent receiving waters. Because these measures are included in the SERP Manual and are part of project implementation, the short-term construction-related drainage and water quality impact of SERP activities would be less than significant.

No mitigation is required.

IMPACT 3.6-2 ***Long-Term Water Quality Effects from the SERP.*** *No land use changes or additional impervious surfaces would result from SERP activities that could result in contaminant loading of local drainages or receiving waters. Erosion repairs would result in a reduction of sedimentation. This impact would be* ***less than significant****.*

No land use changes or additional impervious surfaces would result from SERP activities that could result in contaminant loading of local drainages or receiving waters. Additionally, the erosion repairs would lead to a reduction of sedimentation resulting from existing erosion at the site. Follow-up monitoring of each SERP repair site would also be conducted. Annual monitoring reports would be submitted to the SERP agencies. This compliance would result in a reduction of sedimentation to receiving water bodies because the small erosion sites would be repaired. Therefore, this impact would be less than significant.

No mitigation is required.

IMPACT 3.6-3 ***Potential Increased Risk of Flooding from Increased Stormwater Runoff.*** *The SERP activities would include access to and repair of small erosion sites at levees throughout the Phase 1 SERP coverage area. However, no additional permanent impervious surfaces or alteration of existing drainage patterns would result or increase stormwater runoff. Therefore, this impact would be* ***less than significant****.*

Under the SERP, disturbance to existing grades and vegetation would be limited to the actual site of the project, necessary access routes, and staging areas. SERP activities would not result in changes to the local drainage patterns. Existing rights-of-way would be used to the maximum extent practicable, and the number of access routes, the size of staging areas, and the total area of the project activity would be limited to the minimum necessary to achieve successful repairs. No additional permanent impervious surfaces, which could increase watershed flow rates above the natural background level (i.e., peak flow rates), would result from SERP activities. Therefore, this impact would be less than significant.

No mitigation is required.

IMPACT 3.6-4 ***Hydraulic Effects of the Proposed SERP.*** *The proposed SERP would result in up to 15 small erosion repair projects per year on small areas of levees within the SRFCP area. These projects would have essentially no impact on channel profiles, and have no impact on water surface elevations, including those associated with 100- and 200-year flood conditions upstream of, downstream of, or within the Phase 1 SERP coverage area. Therefore, there would be* ***no impact*** *on hydraulics.*

The SERP would allow up to 15 small levee erosion repair projects per year within the Phase 1SERP coverage area of approximately 306 miles of levees maintained by DWR (Exhibit 3.6-1) to maintain the flood control integrity of the SRFCP system. SERP activities maintain existing levees and do not result in additional levee construction; changes in channel profiles or hydraulics, or the raising of existing levees. SERP efforts result in small-scale repairs (i.e., 0.5 acre or 1,000 linear feet or less) designed to prevent larger erosion sites. Consequently, there would be no impact on water surface elevations, including those associated with 100-year and 200-year flood conditions, upstream of, downstream of, or within the Phase 1 SERP coverage area.

No mitigation is required.

3.6.5 RESIDUAL IMPACTS

Implementation of the SERP would not result in significant impacts on water quality or hydrology; therefore, no mitigation is required, and no significant and unavoidable impacts would occur.